SOME OBSERVATIONS RELATIVE TO THE USE OF GRASS-LAND BY PIGS.

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As during recent years ever. increasing at ten ti on is being given to. the utilisation of pas tures by pigs , it se-ems worth while to examine the. intrinsic worth Of some of the methods of grazing which are being practised or advocated.

The observations herein relate essentially to farms which consist dominantly of grassland and which engage in pig keeping as a side line designed: usually to, bring about better returns- from dairy by-products.. Hence farms on which pig-keeping is the main venture or on,. which arable, cropping is extensive are definitely excluded from consi deration .

On tb-e farms which are to be considered the current utilisation of grassland by pigs is of four principal types.

Type 1 : Pigs have access to. practically no grassland. This practice, though it is dwindling in popularity and has few if any. advoaates, is sti 11 practised by a considerable number .

Type 2: Pigs have continuous access to, one relatively large paddock, say 1 to 3 or 4 acres generally according -to the:- number of pigs. This type- of utilisation has few advocates, but many prac ti ti oners. I t i s distinctly preferable to Type 1.

Its principal advantages are (1) in a whole year the pigs consume a considerable. amount of lafy , nutritious grass. (2) It is relatively inexpensive. (3) G i v e n proper fencing the pigs are confined and the danger of damage by wandering pigs is eliminated.

: Its main disadvantages are (1) there is comparatively little grass available when it is most needed, i.e., when the supply of dairy products is -at a minimum. (2) The're is surplus feed. available in Summer when there is also- a plentiful supply of .&airy by-products. (3) Eventually the 'feed- available from the pas-tures usually: deteriorates in quali ty - clovers decrease.;. grass tends to dominate and to increase in grossness or coarseness.

Type 3: Pigs graze in a series of small paddocks in a manner which h a s been termed rotational grazing. A publi shed description of the small paddock sys tern written by M r . H. M. Peirson,an officer of the. Waikato Pig-recording Club, indicates that to accommodate a pig-keeping o u t f i t. based on 5 to 6 sows two acres of grassland would be subdivided into 10 small paddocks beyond which the pigs would not be allowed to *graze.* Such a lay-out involves over half a mile 'of fences and gates together with piping, etc., for the distribution of water and of dairy by-products . Thfs calls for considerable expenditure which, it is claimed is justified because it enables the pigs to have "as far as possible a fairly continuous supply of grass in the leafy s t a g e ."

It seems to be agreed that tbe small paddock system when operated with sui table equipment facili tate.s. the convenien t and. systematic feeding of pigs . But the advocates of -the small paddock system attribute to it much more important advantages; they, claim that in addition i t provides markedly wholesome and profi table conditions of pig keeping . On the other- hand farmers who are quite

experienced an& relatively successful in pig keeping contend that. they would not employ the small paddock system even if they were offered free of cost the fencing, etc..., entailed in its layout -- a layout whi oh costs the greater part of £100 in providing paddock accommodation to cope with the skim milk from an average herd of 35 to 45 cows.

Such farmers attach much weight to certain disadvantages of the small paddock sys tern.

In the first place over a wide range of conditions in Winter and early Spring when usually leafy feed 9s par ti cularly *needed,* the small paddocks are poached or produotive of comparatively little feed.

Eventually , a-nd indeed fairly soon, the feed from the small paddocks deteriorates substantially, it becomes less wholesome and less .a ttraotive. This is held to bet due to unavoidable changes in the composition of' the swards in. the small paddocks, changes which are a necessary accompaniment of the enrichment of the soil resulting from the concentrated feeding of milk by-products, e tc., to. the. pigs. How great this enrishment is may be gauged from the fact that for each sow kept in an efficient pig keeping uni t of the sort under consideration from 14 to, 16 tons of skim. milk is fed annually. After allowance is made for fertilising material removed in pig-flesh sold, there remains from the skim milk material of fertilising value equivalent to at least 2 tons of sutlphate of ammonia, 17 cwt. of superphosphate and 12 cwt. of 30% potash on 2 acres annually. Fhis is irrespective of any fertilising material introduced by the feeding of meals, grains.,. etc.

Critics of the small paddock sys tern assert that it would be much better, to have such fertilising material distributed as evenly as possible *over* twelve or twenty acres instead of on 2 acres; distributed *over* the larger area it would lead to Improvement, whereas concentrated on the smaller area it leads to deterioration. The protagonist of the small paddock system counters by saying "it may be advisable to shift the layout from time to time." It may, be taken that in practice the labour entailed in such a shifting will lead often to its not being done even when advisable.

The change in the composition of -the pastures in 'the small paddocks consequent upon the enrichment of the soil is considered to be of basic importance. The change normally consists of the suppression of clovers and the dominance of grasses, - often, ryegrass. Considerable field experience shows that the resultant herbage is not attractive and even, if kept in a short, leafy stage of growth it may be expected to be relatively poor in mineral matter which is of much moment in pig raising. Hence there seems good ground for questioning the claim of advo- oates of the small paddock system that i t brings about the provision of markedly wholesome herbage . The small paddock system is also criticised on the score of sost. Even if it were characterised by all tbe important advantages claimed for it, which is not admitted by many, it is held that its cost would often make it impracticable.

Some of those who criticise the small paddock system of pig grazing are not simply destructive critics. They propound and practise an alternative system which constitutes the 4th type of pasture utilisation by pigs which is to be considered'

Important features of the 4th type of utilisation are its simplicity and cheapness. Its essential features briefly are:-

1. As far as possible the pigs graze over fields of many acres the feed from which is consumed mainly by dairy cattle.

2. Normally the grazing is arranged in such a way as to assure the pigs receiving highly nutritious feed from the grassland - fresh',' leafy and satisfactorily rich in clover.

As far as is known' ho one has evolved and put into practice what, he considers a perfect procedure of this type, and so one must be. content herein to outline briefly' the methods and results of two farmers.

First of these is Mr. J. Lauridsen, Linton.

Last *year* Mr. Lauridsen kept 5 sows which were fed wholly on grass except for about 2 weeks before farrowing and for 5 to 6 weeks following farrowing, after which the young pigs were weaned-and the sows returned to grass alone. When on grass the sows were in some of the best pastures on the farm; the bulk of the feed of which is consumed by the dairy cows. Between farrowing and weaning the sows and litters occupy a convenient high quality pasture of about 1½ acres. When the grass is very short and in scant supply as it is 'likely to be in late Winter and early Spring the sows are given a limited amount of chou moellier. Actually during the past Winter the sows received practically nothing but what -they obtained from the pastures. As far as possible between weaning and slaughtering as porkers, the pigs are penned and fed' wholly on skim milk, but should the supply of skim milk at any time not be adequate enough to maintain a satisfactory rate of growth in all the growing as distinct from 'the breeding pigs then some of the growing ones past the weaning stage are given access to pastures- to supplement the skim milk.

The results obtained by Mr. Lauridsen seem significant. His sales, almost wholly in the porker stage are equivalent to 55 lb. of pig flesh for, every hundred pounds of butterfat produced. This compares interestingly with returns of 54 lb. of pig flesh for every'hundred pounds of butterfat cited by Messrs. Phillips and Hale in evidence submitted to the Dairy Commission. In the latter case, the cost of meal, etc., was approximately 5/4d. for each pig sold, whereas in Mr. Lauridsen's case it was 3/-.

Incidentally Mr. Lauridsen sold a greater total number of pigs in the previous season than last year, but details of weights are not available, For the year Mr. Lauridsen sold 15 pigs for each sow kept which is slightly better than the pigs-sold-to-sow ratio in the results cited by Messrs. Phillips and Hale (123 pigs sold from 9 sows.)

A second farmer who employs methods of pasture utilisation by pigs essentially similar to those employed by Mr. Lauridsen obtained the best results noted and features as Farmer H in the published report of Manawatu Pig Recording and Development Club. This farmer produced 48 lb. of pig flesh per 100 lb. of butterfat. His total meal purchases are unusually low relative to the gross returns. (£2. 2. 0 meal costs; £116. 16. 8 gross returns.) This is partly due. to the fact that the feed from dairy by-products and pastures was supplemented by grain and peas grown on the farm. On this farm &he pigs graze systematically over several, pastures totally about 20 acres, in such

a way that they graze leafy, nutritious pastures the grow th of which is controlled by the dairy cows.

Certain aspects of the procedure of the farmers mentioned seem to call for some comment. The fact that Mr. Lauridsen's sows maintain themselves for 36 to 38 weeks of each *year* essen tia lly on pastures is interesting in relation to recent work by the School of Agriculture of Cambridge University. As the result of this work, Dr. Woodman states in the March, 1934, Journal of the , English, Ministry of Agriculture. --

> "As 'regards in-pig sows being permitted unrestricted *grazing,* the herbage so secured (say 12 to 15 lb.) , if young grass, should- be looked upon as furnishing the equivalent of no more than about 2 lb. of meal; and if more mature grass about 1½ 'lb. Indeed, in view' of the energy expended by the sows in grazing and moving about, it is probably safer to assume that these figures over-state the case for grass."

It is slightly unfortunate that the weight of the in-pig sows is not indicated definitely. Marshall and Halnan, also of the Cambridge School of Agriculture., state on page 348 of "Physiology of Farm Animals" (1932) that the bare maintenance ration of pigs of 200 to 250 lb. live weight is the-equivalent of 3.6 to 3.8 lb. of meal daily. And in Woodman's article already quoted he writes, wi t-hout questi oning:-

> "A colleague s ta ted recently ..... it has always been found necessary even when grass is abundant to feed at least 4 lb. of meal per head to maintain the animals in good condi tion. "

It seems that the Cambridge workers have satisfied themselves that pigs cannot maintain -themselves on pastures alone. Yet, Mr. Lauridsen has demonstrated in practice that they can do so. And Mr. Lauridsen's performance in this regard is not at all unique - other farmers in the Manawatu District and doubtless in other districts have managed sows' in a similar way and obtained similarly good results.

The feeding of sows on grass alone between each weaning and farrowing is of great practical moment because it increases the proportion of skim milk available as a dilutedconcentrate for use in rapid flesh production by the pi-gs for slaughter.

It has been urged against the 'feeding of sows on grass alone that while sows so fed might seem satisfactory in oondi tion their litters would be unsatis-fac tory - weaklings, and pigs' dead at birth would be unduly numerous. This 'has, not been so in several instances which have been inves tigated. It is conceivable that the use of pastures badly balanced in botanical composition would provide a diet deficient in mineral matter and result in poor litters,' but the pastures in the instanoes under observation were not badly balanced - the proportion of clover ranged from good to very good - and as the pastures were grazed in a distinctly leafy stage, their content of mineral matter would be relatively high.

It may be as well at this stage to distinguish between a practical possibility and sound farm practice; it is held merely that feeding sows on pastures alone has

been shown to be a practical possibility; it by n'o means follows necessarily that economically it .is sound *practice* - dairy cows can be maintained on pastures alone, but it is not necessarily sound economically to a0 so.

Mr.. Lauridsen's practice of aeaning at 5 to 6 weeks is valued by him for assuring a second litter at a timely stage relative to feed supplies. It is interesting to note that Hi P. Jacques in Modern Pig Keepihg, published in 1930 by Cassell's states:- "In Denmark pigs are weaned at four weeks."

One of the purposes behind Mr. Lauridsen's method of weaning, i.e., the adjustment of feed requirements to feed supplies is refleated in his sales. This is illustrated in those of last season which were as follows:-

Period.	Pigs Sold.
July-August	2
Sep tembe r-Oc tober	11
November-December	18
January-February	21
March-April	11
May-June	12
	75

Underlying such sales is a planned adjustment Of feed requirements to feed production on the farm - a type of. adjustment about which there seems to be considerable neglect.

Disadvantages Attributed to Extensive Grazing of Pigs,

Three objections commonly are raised to the grazing of pigs on wide range.

1. Damage to pastures is held to result from the "rooting" habit of the pigs. This danger can be obviated by suitable "ringing" of the pigs.

2. It is held that ordinary fencing would be insufficient to keep pigs from roaming widely even on to other farms with consequent damage to crops, etc.

Several farmers whose pigs are kept on wide range affirm definitely that the pigs as a rule do not pass through a. reasonably well made and maintained seven-wire fence and observation seems certainly to confirm this view.

3. Et is held that pigs on wide range would be'subject to tuberoular infection from grazing herbage contaminated by tubercular infected cows . On this point the opinion of the Director of the Livestock Division is that there would he some danger of infection in the manner specified, that in practice the danger would not be great; that it would probably be offsc t by the greater vitality with consequent greater general resis tanoc to disease which would result from the free consumption of leafy herbage of high digestibility and miner&i. content and that in short the incidence of disease In pigs on wide range would probably be less than in pigs confined to small paddocks.

So far only accepted facts and the experience and opinions of practising farmers have been cited. From these it is considered that the following are the more important conclusions that may be deduced:-

(1) The small paddock system of grazing of pigs has specific advantages, but that the merits claimed for it cannot be fully substantiated.

(2) That the small paddock system necessarily leads to swards unsatisfactory from the nutritional viewpoint.

(3) That the small paddock system in relation to any advantages attaching to it is unduly costly and that even were its merits from the grassland viewpoint greater its cost would often make it impracticable.

(4) That excellent results have been obtained in an inexpensive manner by pigs grazing on wide range.

(5) That in pig grazing dry breeding animals have been maintained wholly on the feed gathered in wide grazing with consequent good results.

(6) That wide range grazing avoids to a considerable extent the disadvantages of the small paddock system..

None of the methods of pasture utilisation by pigs which has been observed or outlined herein is advanced as an ideal one - so far enough comparative study has not been carried to warrant the formation of definite conclusions.